DOCUMENT RESUME

ED 463 052 PS 030 145

AUTHOR	Tinklin, Teresa; Croxford, Linda; Ducklin, Alan; Frame, Barbara
TITLE	Gender and Pupil Performance. Interchange 70.
INSTITUTION	Scottish Office Education and Industry Dept., Edinburgh. Research and Intelligence Unit.
ISSN	ISSN-0969-613X
PUB DATE	2001-09-00
NOTE	21p.
AVAILABLE FROM	SEED Research Unit, Scottish Executive Education Department, Room 1B, Dockside, Victoria Quay, Edinburgh EH6 6QQ, Scotland. Tel: 0131-244-0167; Fax: 0131-244-5581; Web site: http://www.scotland.gov.uk.
PUB TYPE	Reports - Research (143)
EDRS PRICE	MF01/PC01 Plus Postage.
DESCRIPTORS	*Academic Achievement; Elementary Secondary Education; Females; Foreign Countries; Gender Issues; Influences; Low Achievement; Males; *Sex Differences; Underachievement
IDENTIFIERS	*Scotland

ABSTRACT

This study examined factors that influence the relative academic attainment of males and females and how good performance by both genders can be achieved. The study involved a review of literature and policy documents, statistical analysis of official data, a questionnaire survey of local authorities, and case studies of six secondary schools in Scotland and their associated primary schools. Findings included the following: girls have a better average attainment across school years, although there are still gender differences across the curriculum; boys are assigned more often than girls to learning support programs; and socioeconomic disadvantage is still a major source of underachievement. Findings indicated that there is no one, simple explanation for gender differences, and factors affecting attainment include peer influence, the interaction of teaching and learning styles, teacher-pupil relationships and classroom interactions, curriculum content and assessment methods, and parental and societal influences. These findings suggested several strategies and recommendations for addressing gender differences. (Contains 16 references.) (EV)

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Gender and Pupil Performance

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Gender and Pupil Performance
By

Teresa Tinklin, Linda Croxford,
Alan Ducklin and Barbara Frame

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Gender and Pupil Performance

Introduction

The research project reported here aimed to identify factors which influence the relative attainment of males and females and to provide advice on how good performance by both genders can be achieved. It was carried out in Scotland between October 1999 and January 2001. The research involved:

- a review of the relevant research literature and policy documents;
- statistical analysis of official data;
- a review of current practice relating to gender issues in Scotland based on a questionnaire survey of local authorities;
- case studies of six secondary schools in different parts of Scotland, together with their associated primary schools.

Background

Differences between girls and boys in the experiences and outcomes of school education have been a focus of concern in Scottish education for nearly thirty years. Since the 1970s there was awareness that some aspects of school education may be contributing to the disadvantaged position of women in society and employment. More recently, the focus on raising standards of performance in Scottish schools has highlighted gender differences in attainment, and led to concern that the average level of attainment of boys particularly in school examinations is lower than that of girls. If national targets for raising attainment are to be met, it is important that pupils of both genders should achieve all they can. The research reported here was concerned with understanding the causes of gender differences and with providing advice on how good performance by both genders can be achieved.

Where does the problem lie?

In recent years, the focus of concern has been on the 'underachievement of boys' in public examinations which has generally been seen as a recent phenomenon. Our research shows that this is too simplistic and that there is a complex pattern of gender differences and other inequalities in school education. Our research shows that:

- average levels of attainment have increased for both males and females over the past three decades, but the gain in attainment by males has not kept up with that of females;

- girls have been out-performing boys in school examinations since the mid 1970s;
- gender differences are evident during the pre-school stages, and are found at all stages of primary and secondary schooling;
- there are gender differences in uptake and attainment in different subjects across the curriculum;
- there are gender differences in assignment to learning and behaviour support;
- social background is a greater source of inequality and underachievement than gender.

The current concern over the underachievement of boys is based on their performance in public examina-tions. Is this a broad enough definition of achievement? Are there other forms of achieve-ment that should be taken into account?

Average figures for attainment conceal many differences between groups of pupils: some males achieve very high levels of attainment, and some females fail to achieve examination awards. Our research showed far greater differences in school experiences between high attainers and low attainers of both sexes and between those from advantaged and disadvantaged home backgrounds than between boys and girls. It is also true that females still tend to be disadvantaged in the labour market, in spite of their better average attainment levels. We agree with the conclusions of Australian researchers (Collins *et al*, 2000) that it is more helpful to consider the "gender jigsaw" than the "gender gap", because males and females are not homogeneous groups. They advocate a "which boys? which girls?" approach to tackling underachievement.

Males tend to do better than females in the labour market. Does this impact on performance at school?

Trends over time in secondary school attainment

Current levels of attainment by both males and females are significantly higher than they were twenty or thirty years ago. This is illustrated in Figures 1 and 2 using data on the qualifications of school leavers from the Scottish Executive's Statistical Bulletins.

Figure 1 shows that, while in 1965, 70% of school leavers left school with no O-grade awards at A-C, by 1998 the proportion of school leavers with no Standard Grade awards at 1-3 had fallen to just 18%. The most rapid improvements came after from the change from selective to comprehensive schooling from 1965, and the raising of the school-leaving age to 16 in 1973. It was reinforced by the introduction of Standard Grade from 1986. The figure also shows a gender gap in favour of girls beginning to open up in 1975, and widening thereafter. Although the proportion of males leaving school with no O or S grade awards at A-C or 1-3 has declined dramatically over three decades, it has not caught up with that of females

Figure 1. School leavers with no awards at O-grade A-C or Standard grade 1-3 or better (%)

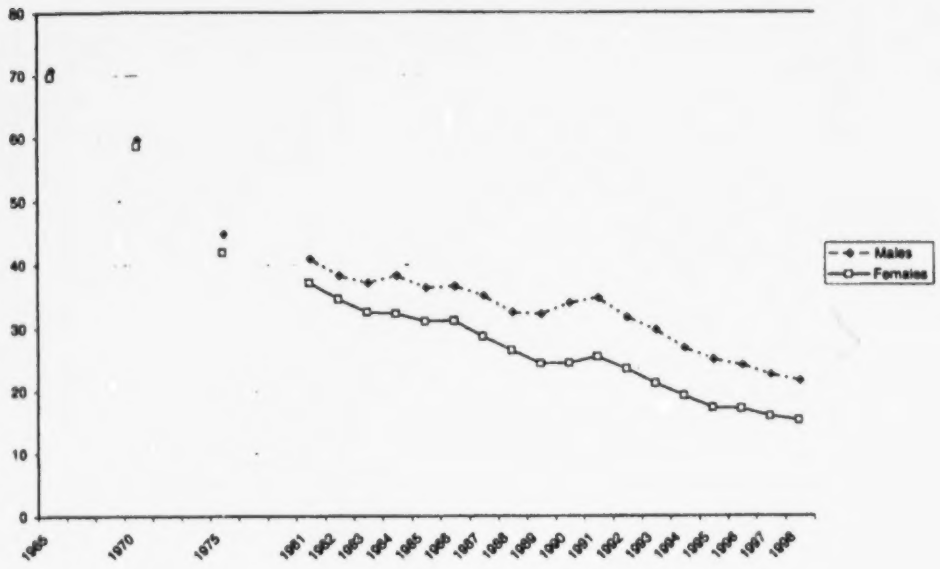
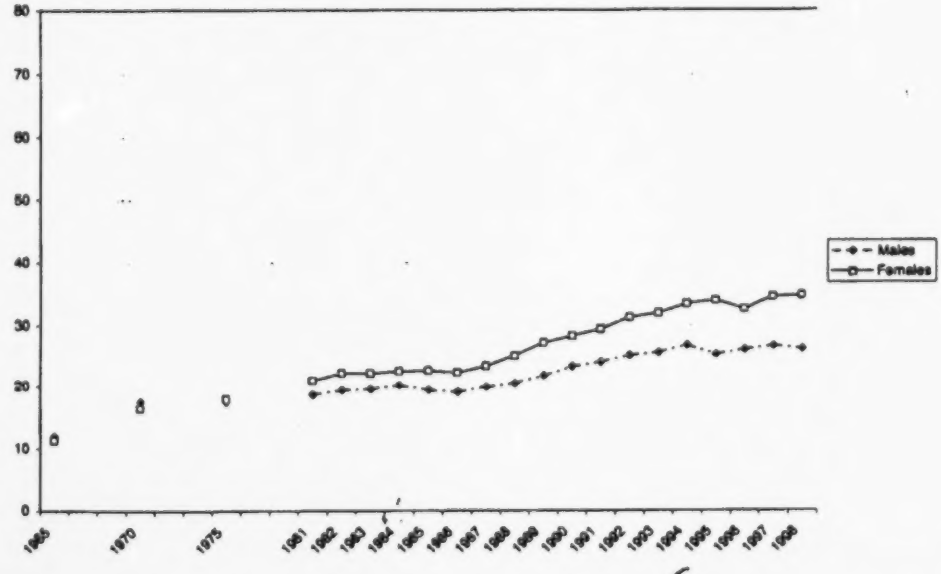


Figure 2 shows the increasing proportion of school leavers with three or more Higher Grade passes at A-C. Since 1965 the proportion of school leavers with three or more Highers has tripled, partly a reflection of the increased levels of participation in post-compulsory schooling. In 1970 slightly more males than females had three or more Highers, but by 1981 this position had been reversed, and Higher Grade attainment by females has exceeded that of males ever since.

Figure 2. School leavers with three of more Higher grade passes (%)



Gender differences from pre-school through to secondary school

There is evidence of gender differences at all stages of school education. As early as pre-school (ages 4-5), the national pilot of Baseline Assessment found that more girls than boys were rated highly by their teachers on: personal, social and emotional development; physical co-ordination; expressive communication; listening and talking; reading and writing; mathematics and understanding the environment. (Wilkinson *et al*, 1999).

Girls tend to outperform boys throughout primary school in reading. Evidence from the Early Intervention Programme (EIP) shows that, on average, girls had higher reading scores than boys at the start of Primary 1, and at the end of Primary 3 (Fraser *et al* 2001.) The Assessment of Achievement Programme (AAP) shows that girls are performing consistently better than boys in reading and writing at P4, P7 and S2 (Scottish Executive, 2000).

In mathematics the pattern of performance is less clear. The national evaluation of EIP found no evidence of gender differences in mathematics at the end of Primary 3 (Fraser *et al* 2001), and the AAP found no significant differences between the performances of girls and boys in the 1997 Mathematics survey, which covered P4, P7 and S2 (Scottish Office, 1998).

Gender differences are well-documented at the secondary school stage, through Standard and Higher Grade results. Table 1 shows that females gain more Standard Grade awards than males on average and the largest differences in performance are found at the highest levels of attainment, with more females than males gaining five or more awards at 1-2 (Credit level) and 1-4 (General and Credit level). A similar pattern is found at Higher Grade: 55% of young men compared with 61% of young women completed S5 and S6 with three or more Higher Grade passes at A-C in 1999.

Table 1. Percentage of males and females gaining five or more Standard Grade awards in 1999

Level of Standard Grade awards	Males	Females	Difference in favour of females
1-2 (Credit)	29	40	+11
1-4 (General or Credit)	73	81	+8
1-6 (Foundation, General or Credit)	92	94	+2

Gender differences across the curriculum

Girls' better average attainment hides differences in uptake and attainment in different subjects across the curriculum. Historically, there has been a tendency for male and female students to choose to study different subjects where there has been opportunity for choice. Nowadays, the Curriculum Framework and National Guidelines advise that pupils cover all modes of the curriculum to the end of S4. However, data from the Scottish Qualifications Authority (SQA) in 1999 showed that there were gender differences in

subjects chosen within some modes. For example, within the scientific studies mode, 70% of biology candidates were female compared with only 31% of physics candidates, while within the technological activities mode, 80% of candidates for office and information studies were female compared with just 36% for computing studies.

In the past, males tended to out-perform females in certain subject areas such as mathematics and physics. The 1999 SQA data, however, show that female candidates at Standard Grade were more likely than males to gain awards at Credit level or at General/Credit level in almost every subject they entered, with the exception of physical education, economics and general science.

At Higher Grade, gender differences in subject choice increased still further. The core subjects of English and mathematics showed some degree of balance, with 57% of English candidates and 47% of mathematics candidates being female. However, gender differences described above continued and, in addition, the majority of Higher Grade candidates were female in modern languages, history, modern studies, art, drama, music and religious studies, while the majority of physical education candidates were male. At Higher Grade, as at Standard Grade, female candidates were more likely than males to gain a pass at A-C in every subject they entered, except for human biology and accounting and finance.

Young people's subject choices are important in determining their future opportunities in further/higher education and careers. While the young people that we interviewed were very clear in the view that males and females should be able to study any subject they wanted, the data showed that they are still opting for gender-typical subjects where there is room for choice. They said they chose subjects they liked, those they were good at and those which they thought would be useful for the careers they were interested in. Some also cited the influence of parents and peers on their choices. Teachers, however, also explained choices in terms of stereotyped attitudes towards subjects and perceived difficulty.

Learning and behavioural support

Another gender difference in school education is that more boys than girls are assigned to learning and behavioural support. There is a preponderance of boys in all categories of learning difficulty, and boys outnumber girls in special schools by 2:1. The most marked gender difference was in the area of emotional and behavioural difficulties, which comprised 81% boys (Riddell 1996). Staff in the schools included in our study estimated that the ratio of boys to girls receiving additional support ranged from 2:1 to 5:1. There was some suggestion that when boys were having difficulties they were more conspicuous and disruptive than girls and that this partly explained their greater representation in learning and behaviour support.

> *"I just feel that if girls have difficulties ... on the whole they tend to work harder and keep their heads down and try and do the best that they can do. Whereas boys, I think, if they can't cope, there's other distractions or they draw attention to themselves in some other way. Maybe by bad behaviour or being silly or playing the fool."* (PT Learning Support)

Social Background

Socio-economic disadvantage is still a major source of underachievement and social inequality in Scotland. Figure 3 is based on data from the Scottish School Leavers' Survey (SSLS) of pupils who sat Standard Grade in summer 1998, and compares the proportion of pupils of different gender and social class (based on father's occupation) gaining five or more credit level awards.

Figure 3. S4 students attaining 5 or more Standard Grade awards at Credit level in 1998

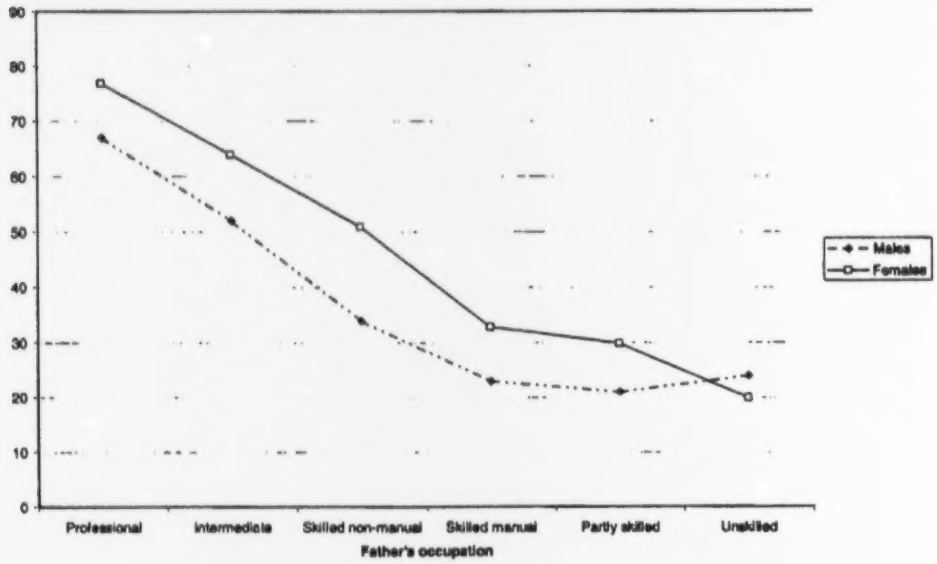


Figure 3 shows that differences in attainment between males and females are fairly constant across all levels of social class except among pupils with fathers in unskilled occupations.

Inequalities emerge as early as pre-school and primary school. How best can we monitor inequalities from this young age?

We found that the effects of social class were stronger than the effects of gender. 71% of young people with fathers in professional occupations attained five or more credit awards, compared with 28% of young people whose fathers were in skilled manual occupations, a difference of 43%. The attainment gap between pupils of different social class is much larger than the attainment gap between males and females (11% in Standard Grade, Credit level in Table 1 above).

What factors are associated with gender differences in performance?

It is clear from research that there is no single, simple explanation for gender differences in performance at pre-school, primary through to secondary school and beyond, allowing for differences between subject areas, changes over time and differences by social background. In addition, any explanation of gender differences needs to take account of factors occurring across the developed

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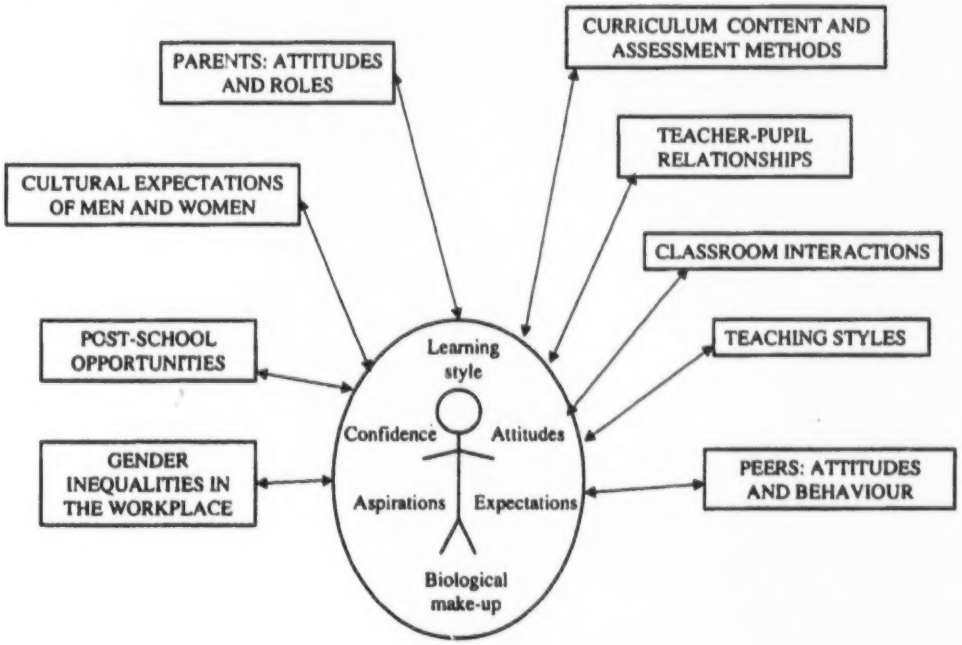
world, since similar trends in attainment have been reported in other countries including France, Germany, Australia, Jamaica and the rest of the United Kingdom (Sutherland, 1999).

Changes over time and similarities and differences across cultures make simple biological explanations inadequate. If gender differences could be explained in biological terms then there would be no cross-cultural differences. Furthermore, the changes over time displayed in Figures 1 and 2 suggest strong evidence for the influence of cultural attitudes and expectations on the behaviour of young people. In the 1950s girls and boys had very different post-school expectations, which affected their attitudes and behaviour within school, whereas our data show that, in the year 2000, both girls and boys hoped for a worthwhile and successful career and saw childcare as a joint responsibility. This marks a change in attitudes and, we would argue, is linked to rising levels of female attainment at school.

A complex range of factors influence young people's ideas, attitudes and behaviour, suggesting that a range of strategies will be needed to address gender differences. How best can schools adopt a coherent approach to tackling these issues?

Biological make-up is only influential in interaction with a range of social, environmental and cultural factors, which influence a young person's attitudes, aspirations, expectations and confidence levels. Figure 4 displays the range of factors that research by ourselves and others has shown to influence gender differences in young people.

Figure 4 Factors influencing gender differences



The influence of peers

There is evidence of peer pressure on some boys not to be seen to be trying too hard or doing too well at school (Adler *et al*, 1992; Arnot *et al*, 1998). Boys who were academically successful were seen as 'uncool' and could suffer for it among their peers. This created an 'achievement ceiling' on their performance, beyond which it was risky to go. Over half the pupils who took part in the research agreed that if boys worked too hard at school their friends would make fun of them. Only one quarter of the girls said that this was true for girls as well.

The interaction of teaching and learning styles

Research (Adey *et al*, 2000) suggests that young people have preferred learning styles which are established at a young age. There is a lack of agreement in the literature over the exact classification of styles, but one possible grouping is into visual, auditory and interactive learners. While people tend to have a preferred style they also make use of other styles as well. The argument is that if young people predominantly encounter teaching styles which do not match their preferred learning styles, they will become de-motivated and disengaged. The research suggests that teachers should employ a variety of different strategies in order to engage with as many young people as possible in different ways. The over-riding aim being not to entrench students in one learning style, but to engage with them and get them used to operating within a variety of modes themselves. The research suggests that males and females tend to have different learning styles, but there is a big overlap.

Teacher-pupil relationships and classroom interactions

The research on classroom interaction (Howe, 1997) shows that boys tend to dominate in whole class settings. They contribute more to discussions, attract more attention through misbehaviour and tend to dominate in physical settings (e.g. using computers, doing experiments). Girls help to create this situation and the evidence suggests that they are not disadvantaged academically by it, because they tend to compensate by seeking help one-to-one. The teachers that we spoke to corroborated these findings.

The students that we spoke to believed that a good relationship between themselves and the teacher improved their performance at school. They liked teachers who treated them with respect, could have a laugh and who put effort into making the work enjoyable.

Boy: "If you like him [the teacher] you don't want to make him look bad so you work to try and make him look good ..."

Boy: "I think that if you've got a relationship with a teacher and you're friends with him you're going to work harder."

(Boys group, lower ability)

Boys were seen by teachers and pupils as more likely to be ill-prepared, competitive, disruptive, over-confident and inattentive in class. Girls, on the other hand, were seen as generally better prepared, more conscientious,

co-operative, organised, respectful, to tend to under-estimate their abilities and to produce better-presented work. On the whole, boys were seen as being less mature and less motivated than girls.

There was evidence of some disagreement between teachers' and pupils' views on classroom interactions. Teachers believed that they applied the same rules to all pupils, and that any differences in the treatment of boys and girls were in response to the pupils' own behaviour. Pupil groups believed that boys got harsher punishments than girls for the same misdemeanours and that girls were expected to behave better than boys by teachers.

Curriculum content and assessment methods

There is some evidence from both the research literature and case studies of gender differences in approach to and attainment in different kinds of tasks and assessments. Some writers and interviewees argued that the increased emphasis on coursework, brought in with the introduction of Standard Grade, has favoured girls' approaches to assessment and that this explains the gender gap in performance. Indeed there is evidence that girls do slightly better than boys on coursework elements and that boys do better on multiple-choice tests. However, this does not explain the gender gap, because in fact girls do better overall on coursework and examinations (Sukhnandan, 1999) and the gender gap pre-dated the introduction of Standard Grade. The main conclusion from this work was that a variety of assessment modes should be used in order to provide all pupils with the opportunity to produce their best performance.

Parents, the local area, society and post-school opportunities

Parents, home background, post-school opportunities and society were all seen as very important influences on young people's views about what it means to be male and female. There is a strong link between educational attainment and home background and the link between social disadvantage and low attainment was seen by staff as connected with parental attitudes towards education. This was contradicted by pupils who almost unanimously stated that their parents encouraged them to do well at school in order to improve their post-school opportunities. All of the parents that we spoke to confirmed this view.

The young people interviewed generally held modern views on the roles of men and women in work and the family. This suggests that the Sex Discrimination Act 1975 and the rhetoric, policies and practice of Equal Opportunities, as well as more specific initiatives such as Women Into Science and Engineering, have been influential in changing attitudes towards the roles of men and women in society. Students were clear that it was important for both men and women to have successful and worthwhile careers and that women and men could do any jobs they wanted to. Qualifications were seen as essential to securing a good job in the future. They were almost unanimous that childcare should be a joint responsibility. Their views were tempered, however, by inequalities that they saw around them in their own families and the workplace. They were aware that men and women entering non-traditional occupations could face prejudice from employers and colleagues and that employers might favour men because of the risk of women leaving through

Attitudes and existing inequalities in society are clearly still influential on young people's ideas about what it means to be male and female. To what extent can schools be expected to address these elements of gender differences?

pregnancy. Some pupils thought that it would be more likely to be the woman who brought up children because the man would have the better job.

Post-school opportunities for young people have changed over the past few decades and this has affected their staying-on rates and their aspirations within school. While opportunities for high attainers to progress through the traditional route of higher education have expanded, opportunities for low-attaining young people to enter the labour market and training have decreased. Many young people, especially males, who in the past would have left school at the earliest opportunity, now perceive the need to stay on at school for longer periods. It therefore becomes more important for these young people to achieve worthwhile outcomes within the school environment, but there may be greater tension if the curriculum of the school is not perceived as relevant by this group.

Strategies for addressing gender differences

Schools are being creative in the strategies that they are adopting to tackle gender differences. Is there a need for more rigorous evaluation of the effects of these strategies?

The extent and nature of activity across Scotland

Schools in about half the local authority areas were trying out specific strategies aimed at addressing gender differences, while in the rest, orientation and preparation activities only were underway or no activity at all.

The schools included as case studies for the research were using a wide range of strategies to address gender differences in performance. Staff, pupils and parents described to us their experiences and the pros and cons. However, most of the strategies had been in place for a relatively short time, and it is not possible to provide hard evidence of their effectiveness.

Getting started

Some of the initial steps taken by schools getting started on strategies addressing gender differences in attainment are summarised below.

- Awareness raising of staff, pupils and parents formed an important first step in the development of schools' approaches to addressing gender differences.
- In-service training had most often been done using a cascade model, but it was reported to be most effective where it allowed for the direct involvement of teachers.
- Development of whole-school policies had several advantages, including coherence of approach across the school, greater awareness among all staff and reinforcement of approaches adopted.
- The formation of working groups of teachers had provided a means of sharing good practice across the curriculum.
- The formation of a cross-sector working group in one case study area had proved fruitful. Common strategies had been developed and tried and participants had welcomed discussion of statistics, issues and strategies.

- Consulting pupils had proved a useful part of developing school policy on issues such as gender differences.
- The involvement of parents was seen as a crucial element of working with under-achieving pupils.

We concluded that all of these approaches are potentially valuable aspects of good practice.

Changing gender stereotypes and attitudes

Schools were attempting to change attitudes, gender stereotypes and negative peer pressure and to raise aspirations from a number of different angles.

- Teaching about equal opportunities and encouraging students to take up non-traditional subjects and gender-atypical careers: the research indicated that the promotion of equal opportunities in schools has affected young people's attitudes and aspirations towards work and family roles.
- Positive role models were being used to try to counteract negative images that young people might see around them and on television. For example, the local football team might be invited to promote reading to boys, or female doctors and male nurses might be invited to address students.
- Strategies to raise aspirations and self-esteem were linked to other strategies to counteract negative gender stereotypes, to tackle behavioural problems and to raise attainment.
- The use of praise and rewards was considered important by teachers in motivating pupils. However, pupils had mixed views about how effective it was. More consultation with pupils might be helpful here..

There is still a gender imbalance in the profile of staff in schools, with females over-represented in teaching posts and under-represented in management positions. Does this imbalance influence pupils' behaviour and performance?

All of the above approaches were linked and apparently reinforced each other. They all made important contributions to addressing fundamental causes of gender differences in aspirations and expectations.

Learning, teaching and classroom management

The main approaches adopted by schools in the area of learning, teaching and classroom management were as follows.

- Teaching by using as wide a range of learning styles as possible was viewed as general good practice. Examples included giving an overview and linking with previous lessons, using visual aids, using a variety of approaches within each lesson, breaking tasks into sub-goals, pupils working in pairs and groups, self-evaluation by pupils and reviewing learning at the end of the lesson. Teachers involved were generally enthusiastic about these approaches, which got away from viewing boys and girls as homogeneous groups and focused attention onto improving classroom practice for all pupils.
- Literacy strategies: Initiatives aimed at encouraging boys to read seemed to be having beneficial effects and whole-school correction codes for spelling, punctuation and grammar seemed potentially effective.

- One case-study school introduced single-sex classes in English and mathematics for it's middle-attaining group, and had simultaneously halved the class size to 15. Teachers and pupils generally saw the single-sex groups as beneficial, although it is likely that the smaller class sizes were contributing to their success. Schools adopting this approach need to be aware of the risk that boys and girls might be viewed as homogeneous groups and that stereotyped expectations, attitudes and behaviour be reinforced rather than challenged.
- Boy-girl seating seemed to reduce disruption in the classroom, but girls generally felt uncomfortable about it. There seemed little evidence that boys and girls were influencing each other's styles of working, or gaining a richer educational experience because of it.

Strategies targeted at underachievement

Some of the strategies schools had adopted to combat underachievement were not overtly focused on gender differences, but had gender implications because more boys than girls were perceived to be underachieving. Strategies thought to be successful included study support, mentoring, and building confidence and self-esteem.

> *"Because we have some quite large classes, some kids just tend to fall by the wayside, and really ... all they need is somebody there and ... aware that they're not working to their potential – for those kids mentoring did work."* (Guidance and Mathematics teacher)

Some schools were developing systems of target setting for individual pupils. Pupils had mixed feelings about these systems and it is not yet evident how successful they will be.

Recommendations for policy-makers and practitioners to consider

1. **We advocate the adoption of a "which boys, which girls" approach to addressing underachievement.**

2. **A broader definition of achievement than examination results needs to be re-emphasised.**

3. **Strategies to raise attainment should address other sources of inequality as well as gender. There is a need to raise awareness in local authorities and schools of the complex, interlocking range of inequalities in education, including differences by social class, ethnicity and gender.**

4. **There should be a greater focus on inequalities by gender, social class and ethnicity at the pre-school and primary stages.**

5. **More data would be useful at the primary stages on attainment and pupil characteristics.**

6. **Schools seeking to address gender differences need to take account of the complex range of factors influencing young people. These include:**
   - **teacher-pupil relationships and classroom interactions;**
   - **the interaction of teaching and learning styles;**
   - **curriculum content and assessment methods;**
   - **the promotion of equal opportunities in schools;**
   - **wider school ethos;**
   - **the attitudes and behaviour of peers;**
   - **parents' attitudes towards education, their views on gender roles and their own roles in the family and the workplace;**
   - **opportunities available to young people post-school and in the future;**
   - **cultural views of male and female roles represented in the media;**
   - **existing inequalities by gender in the family and workplace, including within schools;**

7. **Teachers should be aware of gendered patterns of interaction in the classroom.**

8. **A variety of assessment modes should be used in order to provide pupils with the opportunity to produce their best performance.**

9. **A range of strategies should be adopted by primary and secondary schools to address different aspects of the problem of inequalities in attainment.**

10. **Where these are not already in place, schools should consider the adoption of strategies identified as good practice for all pupils. These include:**
    - **raising awareness of gender differences (and other inequalities) among staff;**
    - **development of whole-school policies;**
    - **providing opportunities for teachers to share experience across the curriculum;**
    - **forging cross-sector links;**
    - **the involvement of pupils and parents;**
    - **codes on language and behaviour that are reinforced across the curriculum.**
11. **Schools and teachers should consider how teaching and learning styles interact in the classroom and reflect on ways to improve teaching and learning for all pupils.**
12. **Strategies such as single-sex grouping and boy-girl seating, should be adopted only where the pros and cons have been fully considered.**
13. **Schools should continue to consider ways to improve boys' literacy skills from pre-school onwards.**
14. **Ways should be sought urgently to tackle the negative effects of peer pressure on pupils, particularly boys.**
15. **Schools need to be flexible in finding ways to target young people identified as underachieving, and considering the needs of the individual as well as the group.**
16. **Schools should continue to promote equal opportunities to pupils.**
17. **Schools and local authorities should continue to promote equal opportunities among school staff.**
18. **Criteria for the measurement of success in relation to gender differences should be identified and measured before and after implementation.**
19. **There is a need for more genuine consultation with pupils over issues that concern them.**
20. **Teachers should note pupils' comments on the importance of a good teacher-pupil relationship in improving pupils' performance at school.**

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If you have views on **Interchange** and/or wish to find out more about SEED's research programme, contact the SEED Research Unit, The Scottish Executive Education Department, Room 1B Dockside, Victoria Quay, Edinburgh EH6 6QQ

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EFF-089 (3/2000)

PS030145